

CA20108 **FAIR NETWORK** of  
micrometeorological mea**S**urements  
(FAIRNESS)

FAIR micrometeorological platform – FMP 2.0  
as a  
Knowledge share platform for  
micrometeorological measurements



Funded by  
the European Union



# OUTLINE

Prof. Branislava Lalic, PFNS, Novi Sad (Serbia)

- Overview of CA20108 FAIRNESS
- Why FAIR micromet data?

Michael Scriney, DCU, Dublin (Ireland)

FAIRness wizard: FAIR Micromet portal FMP2.0 (video)

Prof. Josef Eitzinger, BOKU, Vienna (Austria)

Users experience – BOKU agromet measurements

Milena Marcic, dipl. Ing., PIS, Novi Sad (Serbia)

Users experience – PIS network



# OBJECTIVES

- The FAIRNESS Action intends to **develop synergy** among researchers, stakeholders and civil society, to **fully embrace FAIR data and “3-O”** (Open data, Open innovation, Open to the World) **concepts to enhance application potentials of micrometeorological data and their visibility.**

	WG1 – Networking and Communication	WG2 - Development and implementation	WG3 – Dissemination and application	WG4 – Beyond FAIRNESS strategies
GOAL	Make micrometeorological data FAIR	Improve standardization, methodology and data use	Science and data open to society - Demonstrate FAIRNESS effectiveness	FAIRNESS “life” and application beyond the Action
Research coordination objectives	<p>O1: Establish forum on available micrometeorological networks and data sources</p> <ul style="list-style-type: none"> <li>Inventory of available micrometeorological data in Europe</li> <li>Guidelines for FAIR principles and methodology improvements</li> <li>Gaps and their overcoming in measurement methods and data assimilation</li> </ul>	<p>O2: Development and implementation of Micromet_KSP</p> <ul style="list-style-type: none"> <li>Web implemented micromet_KSP</li> <li>Training courses in data assimilation and management for non-meteorological staff</li> <li>List of pilot data sets, indices and case studies</li> </ul>	<p>O3: Establish FAIRNESS end-users community</p> <ul style="list-style-type: none"> <li>Disseminate case study results</li> <li>Inventory of region-specific stakeholder and users needs</li> <li>List of application examples by stakeholders and Micromet_KSP users</li> </ul>	<p>O4: Guideline for future good practices for micrometeorological measurement strategies and methods, data assimilation and indices</p> <ul style="list-style-type: none"> <li>Evaluation of most important topics from Micromet_KSP analytics</li> <li>Functionalities and concept of future European micrometeorological database – strategy paper</li> <li>Good Practices and recommendations for micrometeorological applications</li> </ul>
Capacity-building objectives	<p>O1: Create a Pan-European multidisciplinary network</p> <ul style="list-style-type: none"> <li>Knowledge transfer among partners and towards society and stakeholders</li> </ul>	<p>O2: Identify and fill gaps in skills and knowledge</p> <ul style="list-style-type: none"> <li>Enhanced and efficient data use, method applications and researcher career development</li> </ul>	<p>O3: Establish FAIRNESS Action “neighbouring” community</p> <ul style="list-style-type: none"> <li>List of “neighbouring” community members</li> </ul>	<p>O4: Build long-term and sustainable cooperation on database establishment and measurement campaign strategies</p> <ul style="list-style-type: none"> <li>Inventory of transferrable activities after the end of the action</li> </ul>
Outcomes				

## FAIR principles

**Findability** - data could be found by humans or machines

**Accessibility** - humans or machines can gain access to data under specific conditions or restrictions

**Interoperability** - data and metadata conform to recognized formats and standards in order to be combined and exchanged.

**Reusability** - data and metadata are licensed, conforming to community norms and allowing users to know what kinds of reuse are permitted



“The total amount of data created, captured, copied, and consumed globally is forecast to increase rapidly, reaching 64.2 zettabytes in 2020. Over the next five years up to 2025, global data creation is projected to grow to more than 180 zettabytes. In 2020, the amount of data created and replicated reached a new high” (Statista, 2022).



“The total amount of data created, captured, copied, and consumed globally is forecast to increase rapidly, reaching **64.2 zettabytes** in 2020. Over the next five years up to **2025**, global data creation is projected to grow to more than **180 zettabytes**. In 2020, the amount of data created and replicated reached a new high” (Statista, 2022).

The lack of data's findability, accessibility, interoperability, and reusability (FAIR) costs Europe a minimum of €10.2bn per year - approximately 78% of the Horizon 2020 budget per year (PwC EU Services, 2018)



“The total amount of data created, captured, copied, and consumed globally is forecast to increase rapidly, reaching **64.2 zettabytes** in 2020. Over the next five years up to **2025**, global data creation is projected to grow to more than **180 zettabytes**. In 2020, the amount of data created and replicated reached a new high” (Statista, 2022).

The lack of data's findability, accessibility, interoperability, and reusability (FAIR) costs Europe a minimum of **€10.2bn per year** - approximately 78% of the Horizon 2020 budget per year (PwC EU Services, 2018)

Define a minimal set of related but independent and separable guiding principles and practices, which enable both machines and humans to find access, interoperate and reuse research data and metadata" (PwC EU Services, 2018).



## FAIR data ≠ OPEN ACCESS data

„The main obstacles to data management and sharing are cultural,...“ not technological

*Marta Teperek and Alastair Dunning  
/https://blogs.lse.ac.uk/impactofsocialsciences/2018/11/  
14/the-main-obstacles-to-better-research-data-  
management-and-sharing-are-cultural-but-change-is-in-  
our-hands/*



ARE YOUR DATA FAIR?



**Table 1. Findability – Data can be found by humans or machines**

Ref	Metric	Test	Current	CA20108 Enhancement Plan
F1	A persistent identifier is assigned to data	True	AWS ID	DOI for every dataset
F2	There are rich metadata describing the data	Partial	Scientific paper (where available)	Metadata Description
F3	The metadata are online in a searchable resource	Partial	Scientific paper (where available)	Searchable Metadata Repository
F4	The metadata record specifies the persistent identifier	True	Paper DOI	Permanent Metadata Repository.

**Table 3. Interoperability – data and metadata conform to recognized formats and standards in order to be combined and exchanged.**

Ref	Metric	Test	Current	CA20108 Enhancement Plan
I1	Data is provided in commonly understood and preferably open formats	Partial	Partly JSON, partly (interactively) csv, Excel.	WMO GAMP with downloadable data & metadata in CSV format.
I2	The metadata provided follows relevant standards	True	WMO GAMP	WMO GAMP
I3	Controlled vocabularies, keywords, thesauri or ontologies are used where possible	Partial	According to best practice	WMO GAMP
I4	Qualified references and links are provided to other related data	Partial	Aggregated with other tools	CA20108 metamodel facilitates embedded links.

**Table 2. Accessibility – humans or machines can gain access to data under specific conditions or restrictions**

Ref	Metric	Test	Current	CA20108 Enhancement Plan
A1	Following the persistent ID will lead to data or associated metadata	True	AWS ID	DOI for every dataset & searchable metadata repository
A2	The protocol by which data can be retrieved follows recognized standards	Partial	http for most data with remaining data in csv format.	Online searchable repository
A3	The access procedure includes authentication and authorization steps	Partial	Mixed Username/password in open access catalogue	Registration required for Cost Action online repository.
A4	Metadata accessible where possible (even when data are not)	True	Paper DOI	Searchable Metadata Repository with access to data.

**Table 4. Reusability – data and metadata are licensed, conforming to community norms and allowing users to know what kinds of reuse are permitted.**

Ref	Metric	Test	Current	CA20108 Enhancement Plan
R1	Data are accurate, well described with many relevant attributes	Partial	Basic quality control checks.	Automated Quality Control checks including data imputation.
R2	The data have a clear and accessible data usage license	True	Data is free to use	Data is free to registered researchers.
R3	It is clear how, why and by whom the data have been created and processed	True	Fully documented.	Part of the Metadata specification.
R4	The data and metadata meet relevant domain standards	Partial	Both data and metadata meet standards for micrometeorological measurements in a field/canopy layer.	WMO GAMP.

PIS micrometeorological network of automated weather stations (AWSs)/Cenej (orchard)/data&metadata available

Lalic, B., Koci, I., Roantree, M., 2022: FAIRness of Micrometeorological Data and Responsible Research and Innovation: an Open Framework for Climate Research, 1-6, "Agroecoinfo 2022 conference", 30.6.-2.7.2022., Volos, Greece. <https://agroecoinfo2022.civ.uth.gr/en>



DO YOU WANT YOUR DATA TO BE FAIR?



# FAIRness wizard: FAIR Micromet portal FMP2.0


[https://www.fairness-ca20108.eu/micromet\\_ksp/](https://www.fairness-ca20108.eu/micromet_ksp/)





Micrometeorological data -  
ours to save and protect

Thank You



Branislava Lalić 

+381214853290 

branislava.lalic@polj.edu.rs 

[www.polj.uns.ac.rs](http://www.polj.uns.ac.rs) 